

Name: _____

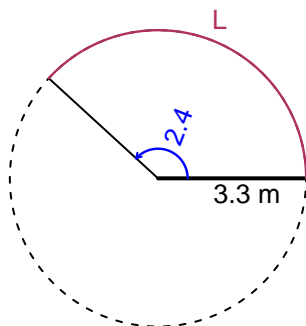
Date: _____

Trig Final (TEST v652)

- You can use a calculator (like [Desmos](#))
- You should have a unit-circle with special angles and coordinates marked.

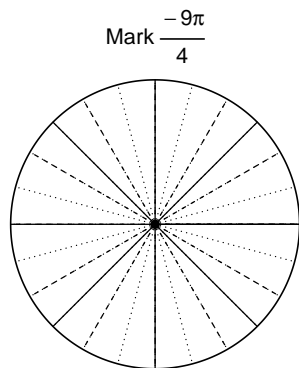
Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The radius is 3.3 meters. The angle measure is 2.4 radians. How long is the arc in meters?

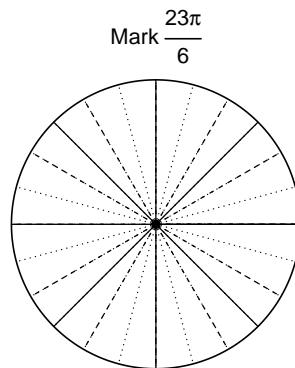


Question 2

Consider angles $-\frac{9\pi}{4}$ and $\frac{23\pi}{6}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\sin\left(-\frac{9\pi}{4}\right)$ and $\cos\left(\frac{23\pi}{6}\right)$ by using a unit circle (provided separately).



Find $\sin(-9\pi/4)$



Find $\cos(23\pi/6)$

Question 3

If $\sin(\theta) = \frac{-60}{61}$, and θ is in quadrant III, determine an exact value for $\tan(\theta)$.

Question 4

A mass-spring system oscillates vertically with a frequency of 3.56 Hz, an amplitude of 6.52 meters, and a midline at $y = 4.97$ meters. At $t = 0$, the mass is at the midline and moving down. Write an equation to model the height (y in meters) as a function of time (t in seconds).